27. (Cancelled)

Remarks

[1] Claims 1-27 are pending in this application. Claims 1-27 stand rejected. Claims 2-4, 21-23 and 27 are cancelled. As a courtesy to the Examiner, the Applicants have used the paragraph structure used by the Examiner to respond to the Examiners requests, objections and rejection. Claims 12-19 are amended to place them in condition for allowance based on the Examiner's statement that they are non-obvious over the prior art. Certain other claims are amended to place them in better form in case of the necessity of an appeal. No new limitations are included in the amendments; so if Examiner does believe they are currently allowable despite Applicants' firm belief that they are, it is respectfully requested that they be entered for purposes of narrowing the issues for an appeal.

Priority

[2] The Examiner is correct that the Supplemental Application Data Sheet is in error. A corrected Supplemental Application Data Sheet referencing the provisional application is submitted with this amendment as Appendix I.

Drawings

[3] The Examiner has objected to the drawings on several grounds. To overcome each the Applicants have done the following:

[3-1] FIG. 6 is amended to substitute "Fail Rate" for "Fall Rate" per the originally submitted drawings. In FIG. 8 "CPU" is substituted for "RAM" for reference character 10 as per the originally submitted drawings.

[3-2] In FIG. 4 the drawing is corrected to remove the first reference character 58, substituting "56" per the originally submitted drawing.

The Applicants apologize that the formal drawing contained these mistakes and believe the Examiner's rejection is overcome.

Specification

[4] The Applicants thank the Examiner for withdrawing the objections to the specification.

Claim Rejection – 35 USC §112, First Paragraph

[5] The Examiner has rejected the application under 35 USC 112, first paragraph, arguing that there is a substantial lack of teaching for the claimed invention.

[6] In the rejection states the Examiner states "how to 'combine the individual values and then add hot-e input based on performance sort" have not been described in the specification."

The Applicants disagree. As stated in the previous amendment the Monte Carlo analysis, which Applicants are using to 'combine the individual values and then add hot-e input based on performance sort' is well known in the art as demonstrated by readily available

textbook sources. To prove this point Applicants have attached in Appendix II three common text book references discussing Monte Carlo analysis in engineering applications. For the first two references only the title pages are provided. The third source, Probabilistic Systems Analysis, presents a practical discussion and application of the Monte Carlo technique. (Note that the author subtitles it as an "Introduction to Probabilistic Models.") Applicants have attached several pages from that text. The Examiner should particularly note the flow chart on page 157. It describes the basic steps behind the Monte Carlo analysis, and forms the basis for Applicant's FIG. 7. Please note also that Figure 7-6 on p. 173, which shows the output of a particular Monte Carlo analysis. (See FIG. 2.) Simply put Applicants are applying a known statistical technique to solve a guardband problem in a novel way by accounting for the tester environment, tester-to-system offset, system environment, and reliability parameters (e.g. hot-e degradation).

In addition, Figure 7 and the text referencing Figure 7 describes Applicants' preferred Monte Carlo analysis of selecting a value from each distribution type (tester environment, tester-to-system offset, and system environment) and then combining (i.e. adding) those values with a hot-e value (based on performance sort) to determine a guardband value for each iteration of the analysis. Applicants' Monte Carlo function, selecting a value from each distribution type and combining those values with a hot-e value, is comparable to the generic Monte Carlo function as illustrated on p. 157 of the third source, Probabilistic Systems Analysis, where the Monte Carlo function is depicted as "Compute $y_i = g(x_1 \dots x_{20})$." This process is continued for n iterations in accordance with the Monte Carlo approach at which time the output is the distribution of guardbands as illustrated in Figure 2.

Each value contributed from the tester environment distribution model contributes a performance value (e.g. FMAX) as described on page 3, lines 12 on. Thus, when the hot-e value is added to the combined distribution values for a particular iteration of the Monte Carlo analysis, the hot-e value added to these combined values corresponds to the

performance value (FMAX) as taught at page 6, lines 8-19 and in accordance with Figure 6.

In conclusion, the Applicants specification is in full compliance with 35 U.S.C., first paragraph.

Claim Rejections – 35 U.S.C. 112, 2nd Paragraph

[7] The Examiner rejected claims 2-3, 12-13 and 15-17 under 35 USC 112, second paragraph.

[8] Applicants have cancelled claims 2 and 3 and amended the other claims to overcome the Examiner's rejections. Claim 1 now includes claim 2 and has an antecedent basis added for "product." Claim 16 now is dependent on claim 13 which contains the referenced step. Claim 20 is amended so that "product" has an antecedent basis in the preamble.

Claim Rejections – 35 U.S.C. 102

[10]   The Examiner rejected now pending claims 1, 6-7, 20-24 and 27 under 35 USC

102(b) as being anticipated by Mittle et al., U.S. Patent 5, 634,001 issued May 27,1997

("Mittle").

[10-2, 3, 4] Mittle does not teach or suggest modeling the tester environment or end-

system environment in which the microprocessor will reside.   Claim 1 has been amended

to introduce in the claim **both the system on which the product is used and tester**

offset as variables. Mittle teaches a method of determining a hot-e guardband by taking

into consideration circuit timing data, operating voltage and case temperature as well as

the voltage / frequency response of a microprocessor.

These are all internal characteristic of the of the "product," ie, microprocessor or inputs

to the microprocessor. They are not the "system" in which the product is used as used

and defined by applicants. Nor does Mittle speak of tester to system offset. Nowhere in

the section sited by the Examiner is there any mention of system to tester offset

especially in terms of what applicants clearly refers to and claims as its invention. Mittle

restricts its teaching to the calculation of a hot-e guardband which is only one

consideration of the present invention.

As stated previously and repeated here, Mittle does not teach or suggest modeling of

"system variables." Instead, Mittle only considers a nominal operating voltage and

temperature at which a microprocessor is expected to operate when determining a hot-e

guardband. Therefore Mittle does not teach "creating a set of **distribution** models

representative of variables" in claim 1.

As stated previously and repeated here, Mittle simply determines the difference expected in a microprocessor's performance between beginning of life (BOL) and end of life (EOL). Mittle does not teach or suggest that the test environment upon which a microprocessor is tested should be modeled to account for variations within that system. Hence there is no teaching of a variable for "system to tester offset" as set forth in claim 1. Mittle discloses circuit-level timing analysis. This is based upon a simulation of a particular circuit. Mittle does not teach or suggest the use of a tester to determine actual circuit performance. A simulation environment on a computer does not inject variations into guardband determinations as does an actual tester environment. An actual tester environment introduces many variations as a result of both electrical and mechanical components. These components do not exist when simulating circuit performance, and thus there is no need to model variations that may exist in a tester environment. So there is no teaching of using the "test system" as a variable.

[10-5] The arguments with regards to claim 1 render claim 6 allowable.

[10-6] As stated previously and as preserved here, Mittle does not teach or suggest a sample of at least 10. In fact, there is no sample size requirement in Mittle. The part of Mittle cited by the Examiner discusses a histogram of propagation delays for all the paths of a microprocessor. There is no sampling as set forth in claim 7, just simply a graphical representation of the delay associated with each path of a microprocessor.

[11-7] As stated previously and as persevered here, Mittle does use a reliability wearout model it does not teach or suggest the use in the context of this invention; i.e., of a "set of distribution models representative of variables that affect the specification." So claim 10 is allowable in view of how it the model is used.

[10-8] As stated previously and as preserved here, the Examiner notes that claim 1 has similar limitations to those in claims 20. Therefore the arguments overcoming anticipation for that claim applies equally well to claim 20.

[10-9] Claim 27 is cancelled.

[11] The Examiner also claims 1, 8-99, 20-23 and 27 under 35 USC 102(b) as being anticipated by Conrad, et al., Calculating Error of Measurement on High Speed Microprocessor Test," Proceeding of International Test Conference, October 1994, pages 793-801 ("Conrad").

[11-1] Claim 1 now contains the limitations in claims 2 and 3. Thus claim 1 is allowable over Conrad.

[11-2,3] Claims 8-9 now rely on claim 1 which in its new form is allowable over Conrad.

In lieu of the above arguments, it is clear that neither Mittle or Conrad teach what is claimed by Applicants.

Claim Rejections – 35 U.S.C. 103

[13]   Claims 5 and 25 are rejected under 35 USC 103(a) in view of Mittle and

Applicants assertion.

[13-1] As stated previously and as preserved here even if it would be obvious to use a

Monte Carlo analysis in light of Mittle, this is irrelevant because Mittle teaching is

limited to how to determine a guardband for reliability wearout mechanisms. Mittle fails

to suggest the use of models (especially models relating to use of the product in a system

and tester offset that are representative of variables in a specification. See discussions

regarding claims 1 and 20 above. As to the Monte Carlo analysis, Mittle actually teaches

away from the use of a Monte Carlo analysis because such an analysis would inject

unnecessary uncertainty into the guardband calculation. The techniques taught in Mittle

have no use for a statistical sampling technique like that taught and claimed by

Applicants. Statistical sampling may actually cause excessive variation in the hot-e

guardband calculation, thus rendering it ineffective. Monte Carlo analysis is suited for

applications where a probabilistic approximation to a solution is desired. Mittle teaches

how to determine an exact guardband based upon circuit timing analysis, operating

voltage and temperature and channel length. A probabilistic approximation is not

desirable in this situation because nothing needs to be approximated.

As stated previously and preserved here, Applicants assertions regarding the variability of the type of statistical analysis tools in its own claimed invention has nothing to do as to whether it would be obvious to include such tools in Mittle.

Since the Examiner has failed to establish that Mittle or Conrad reads on claims 5 and 25, let alone the claims upon which they depend, the Examiners 103 arguments with respect to those claims fail.

[14] The Examiner has rejected claims 11 and 26 under 35 USC 103 as being unpatentable over Mittle ii\n view of Kreyszig, "Advanced Engineering Mathematics," John Wiley & Sons, 1988, pages 1248-1253 ("Kreyszig").

[14-1] With regard to the remaining 103 rejections, the combinations cited by the examiner fail to suggest three of the novel aspects of the present invention set forth in claims 11 and 26. First, there is no suggestion of the use of "distribution models representative of variables that affect a **specification**." Furthermore, there is no suggestion that the distribution models should be analyzed using a statistical tool. The cited art only deals with individual components of a guardband (reliability wearout mechanisms in Mittle). There is no suggestion as to how one would determine an overall guardband based upon reliability wearout mechanisms as well as variations **within both the tester and system in which the product is used**. Finally, there is no suggestion to select a final guardband based upon a statistical analysis.
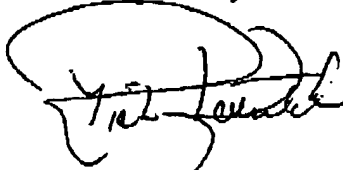
For these reasons claims 11 and 26 are clearly patentable over the prior art.

[15]   Applicants thank the Examiner for finding claims 12-19 non-obvious over the prior

art. These claims now stand alone and are in condition for allowance.

SUMMARY AND CONCLUSION

In view of the foregoing, withdrawal of the rejections and the allowance of the

current pending claims is respectfully requested. If the Examiner feels that the pending

claims could be allowed with minor changes, the Examiner is invited to telephone the

undersigned to discuss an Examiner's Amendment.

Respectfully submitted,

Date: ___Oct 4, 2004___

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